THIS IS ONE VOLUME OF A SIX VOLUME SET WHICH INCLUDES:

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EG&G ROCKY FLATS PLANT	**Manual:**	**5-21000-OPS**
EMD MANUAL OPERATION SOP	**Procedure No.:**	**SW.1, Rev. 2**
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	Effective Date:	**March 1, 1992**
Category 2	**Organization:**	**Environmental Management**

TITLE:
SURFACE WATER DATA
COLLECTION ACTIVITIES

Approved By: _____ MAY 12 1992
(Name of Approver) (Date)

1.0 TABLE OF CONTENTS

REVIEWED FOR CLASSIFICATION/UCNI
By _____
Date March 4, 1992

2.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) describes procedures that will be used at the Rocky Flats Plant (RFP) in the performance of field activities at surface water collection sites. This SOP describes initial site evaluation procedures and outlines an order of data collection activities to be performed at each site by a two or three member field crew. Details are provided in this document so that all sampling personnel following these procedures will deliver samples to the laboratory and will perform discharge and field parameter measurements in a consistent manner.

3.0 RESPONSIBILITIES AND QUALIFICATIONS

The project manager or task leader is responsible for assigning project staff to complete surface water data collection activities at RFP property. The task leader is also responsible for ensuring that this and other appropriate procedures are followed by project personnel.

Personnel performing surface water sampling activities will be geologists, hydrologists, engineers, or field technicians with an appropriate amount of applicable field experience or on-the-job training under supervision of another qualified person.

4.0 REFERENCES

4.1 SOURCE REFERENCES

The following is a list of references reviewed prior to the writing of this procedure:

General Environmental Protection Program. DOE Order 5400.1 November 1988.

Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. Interim Final. EPA/540/g-89/004, October 1988.

RCRA Facility Investigation Guidance. U.S. Environmental Protection Agency, Interim Final. May 1989.

Test Methods for Evaluating Solid Waste. Physical/Chemical Methods, SW-846. EPA. September 1986.

NPDES Compliance Sampling Inspection Manual. U.S. Environmental Protection Agency, MCD-51. 1979.

NPDES/FFCA Operations Sampling Plan. Environmental Management Surface Water Division, Rocky Flats. (In Progress).

4.2 INTERNAL REFERENCES

Related SOP's cross-referenced by this SOP are as follows:

- SOP FO.3, General Equipment Decontamination
- SOP FO.6, Handling of Personal Protective Equipment
- SOP FO.7, Handling of Decontamination Water & Wash Water
- SOP FO.10, Receiving, Labeling, and Handling Environmental Materials Containers
- SOP FO.13, Containerizing, Preserving, Handling, and Shipping of Soil and Water Samples
- SOP FO.19, Base Laboratory Work
- SOP SW.1, Surface Water Collection Activities

- SOP SW.2, Field Measurement of Surface Water Parameters
- SOP SW.3, Surface Water Sampling
- SOP SW.4, Discharge Measurements

5.0 METHODS

5.1 PREPARATIONS FOR FIELD ACTIVITIES

To prepare for the daily field data collection activities, SOP FO.19, Base Laboratory Work, will be followed. In addition, the field teams will verify that items required in the field equipment checklist (Form SW.1B) are in the field vehicle and are in proper working order before leaving for the field each day.

5.2 SITE EVALUATION

Upon arrival at the field data collection site, the field crew will park the field vehicle on the most level ground available, as close to the surface water site as is practical. The crew will review the sample site field folder to locate the sampling point and to become familiar with historical conditions at the site.

The crew will select an area to perform decontamination procedures. The decontamination facility must be located between the sampling site and the field vehicle. Decontamination equipment will be placed on plastic sheeting a reasonable distance away from both the sampling site and the field vehicle, and will be arranged for efficient use.

The crew will carry the following to the data collection site: (1) instruments for measuring in-stream water quality parameters and temperature, (2) equipment for measuring discharge appropriate to the flow regime, and (3) water sampling equipment and containers. However, typically, the crew will be able to work directly from the field vehicle. In this case, the crew will

proceed to the stream or data collection point.

The sampling team will perform field parameter measurements as described in SOP SW.2, Field Measurement of Surface Water Field Parameters. The team will collect representative water quality samples as outlined in SOP SW.3, Surface Water Sampling, and will perform discharge measurements as described in SOP SW.4, Discharge Measurement. Water quality samples will always be obtained before discharge measurement. The proper sequence for these procedures is addressed in Section 5.3.

5.3 DATA COLLECTION

A suggested sequence for data collection and site activities is as follows:

- Dress in appropriate personal protective equipment (PPE)
- Set up decontamination line
- In accordance with the field folder, SOP SW.3, Surface Water Sampling, and SOP SW.4, Discharge Measurement, a technician will select and assemble water sampling and discharge measuring equipment. The equipment will be arranged conveniently on plastic sheeting.
- A technician will record site I.D., date, names of party members, weather conditions, and air temperature.
- A technician will observe and record site-specific conditions which impact selection of flow measurement or water sampling techniques.

- A technician will evaluate the site and determine the point at which sampling and discharge measurements will be accomplished, as per guidelines in SOP SW.3, Surface Water Sampling and SOP SW.4, Discharge Measurement.

- A technician will measure and record the water temperature in the field logbook, and will set up the dissolved oxygen (D.O.) meter for in-situ measurement. The D.O. probe will be calibrated, as described in SOP SW.2, Field Measurement of Surface Water Field Parameters. The D.O. will then be measured and recorded in accordance with SOP SW.2.

- A technician will assemble, check and/or calibrate the pH meter and conductivity meter as described in SOP SW.2, Field Measurement of Surface Water Field Parameters. A technician will then measure pH, specific conductance, alkalinity, and other field parameters, and filter samples as required in SOP SW.2 and SOP SW.3. Field parameter measurements and sampling times will be recorded on the field form.

- If the water is to be sampled for VOCs, Cyanide, or BNA analysis, a technician will collect a representative sample from the stream to be analyzed for Total Residual Chlorine. This is needed to determine preservation requirements for those samples. Total Residual Chlorine measurements will be made in accordance with SOP SW.2, Field Measurements of Surface Water Field Parameters.

- A technician will then employ the appropriate method to collect representative water quality samples from the stream in accordance with SOP SW.3, Surface Water Sampling, and will perform the remaining field parameter measurements. A technician will record the sample time, to the nearest five minutes, and carry the water samples to the decontamination area.

- A technician will decontaminate and package the samples, according to SOP FO.13, Containerizing, Preserving, Handling, and Shipping of Soil and Water Samples.

- A technician will perform a premeasurement spin test of the current meter if it is to be used for discharge measurement, and will record the result of the spin test. This test will be performed in a place sheltered from the wind.

- A technician will measure discharge by using the method appropriate to the flow regime, as described in SOP SW.4, Discharge Measurement.

- A technician will perform a post-measurement spin test of the current meter if it has been used for discharge measurement, and will record the result on the Surface Water Data Collection Field Notes.

- A technician will disassemble, decontaminate, and store the data collection instruments. Decontamination methods are detailed in SOP FO.3, General Equipment Decontamination.

- Environmental liquids, including decontamination water, residual samples, and wash water will be handled as described in SOP FO.7, Handling of Decontamination Water and Wash Water.

- Environmental materials will be handled in accordance with SOP FO.10, Receiving, Labeling, and Handling Environmental Materials Containers.

- Both technicians will survey the area to verify that all equipment has been returned to the vehicle.

- The technicians will perform personal decontamination in accordance with SOP FO.6, Handling of Personal Protective Equipment, before entering the field vehicle or proceeding to the next data collection site or the base laboratory operation facility.

The foregoing sequence of data collection and site activities may vary with site conditions. For example, discharge may not be measured if there is no flow. However, field activities will be generally guided by the list, and a technician initiating a specific task will carry the task to completion.

6.0 DOCUMENTATION

All field activities will be recorded in field logbooks or on field forms. The Surface Water Data Collection Form (Form SW.1A) is used to record surface water sample collection data. Descriptions of problems encountered and deviations from the SOP will also be recorded.

The Surface Water Data Collection Form is used to record data collected at each site. The information on the form should be initialed next to each entry as it is made. All data obtained in surface water data collection activities will be recorded in the surface water field note. The surface water data collection form also includes sections for sampling conditions, methods, and weather conditions. Field note entries will include, at a minimum the following information:

- Date and time of each entry or activity
- Names of field personnel
- Names of all visitors to the site during field activities
- Location of field activities
- Description of sampling conditions, location, method, sampler types, materials, and weather.

- Field parameter measurements
- Discharge measurements and calculations
- List of analytes and preservatives
- Comments and observations

SURFACE WATER DATA COLLECTION FIELD NOTES

SAMPLE ID:_____ SITE ID:_____ LOCATION:_____

COLLECTION DATE:_____ QUARTER: 1 2 3 4 DRY: Y / N

COLLECTION TIME:_____ PURPOSE: _____

SAMPLE TYPE: Grab Composite Depth-Integrated EWI-Composite Other_____

COMPOSITE DESCRIPTION: _____

QC TYPE: REAL MS MSD LR DUP RNS QC PARTNER:_____

SAMPLES COLLECTED BY IMMERSION: _____

SAMPLES COLLECTED BY DIPPER: _____

SAMPLER TYPE: Bucket Beaker/Dipper Other_____

TEAM LEADER_____ TECH_____ TECH_____ TECH_____

VOLUME COLLECTED: _____ UNITS: _____

COMMENTS: DISSOLVED METALS FILTERED OTHER: _____

Sample Location Description: Pool Pond Puddle Stream Seep Ditch Other _____

Water Is: Rising Falling Steady Insuff. Water Dry Ice Coverage % _____ Other _____

Sampled from: Shore Waded Boat Bridge Other _____

Collection Points: LB/RB _____, _____, _____, _____, _____, _____, _____, _____, LB/RB

Sampler Composition: Teflon Glass Stainless Steel Other _____

Weather:
Clear Calm Hot Sunny P/C Lt. Breeze Warm Fog Cloudy Windy Cool Rain
Gusty Cold Sleet V. Cold Snow Other _____

SITE VISITOR_____ COMPANY_____
SITE VISITOR_____ COMPANY_____
SITE VISITOR_____ COMPANY_____

Sampler_____ Parameters_____

FIELD CALIBRATION								
PARA-METER	METER ID	VALUE	UNIT	TEMP °C	STANDARD	RANGE SET	TIME	INITIALS
pH			UNITS			—		
SC			mS/CM					
DO			MG/L					

Prepared by _____ Signature _____

SURFACE WATER DATA COLLECTION FIELD NOTES

DEPTH _____ FIELD MEASUREMENTS

PARA-METER	METER ID	VALUE	UNIT	TEMP °C	STANDARD	RANGE SET	TIME	INITIALS
T air			°C		—	—		
T H_2O			°C		—	—		
DO			MG/L		—			
pH			UNITS		—			
CL_2			MG/L	—	DPD	—		
ALKA			MG/L		1.6/.16 N H_2SO_4/50ml 100ml	DIGITAL COUNTS 8.3: 4.5:		
SC			mS/CM					
SILICA								

DISCHARGE MEASUREMENT NOTES

Party: _____ Comp. By _____ Checked By _____

Width: _____ Area: _____ Gage Height: _____

Method: _____ Type of Meter: _____ Spin: Before _____ After _____

Comments/observations: _____

Cross Section _____

Flow _____

Other _____

DIST FROM INIT POINT	WIDTH (FT)	DEPTH (FT)	OBSER DEPTH	REVS	TIME (SEC)	VELOCITY (F/S)		AREA (FT^2)	DISCHARGE (CFS)
						AT POINT	MEAN IN VERTICAL		

Total Discharge _____

Site ID _____ Date _____ Signature _____

FIELD EQUIPMENT CHECKLIST

1.SW Equipment

Conductivity Meter _____

pH meter and standards _____

Dissolved Oxygen (D.O.) meter _____

Alkalinity equipment: titrator, stir bars, stirrer, acid cartridges (.16 and 1.6N H_2SO_4) _____

Sample bottles (plus extras) _____

Thermometers _____

Samplers for all sampling conditions (including extension rods) _____

Sample Coolers _____

Sample Containers with appropriate preservatives _____

Blue ice _____

Gloves _____

Churn splitter (if required) _____

Peristaltic pump _____

pH paper _____

Lab glassware _____

Filters (0.45 μm in-line filters) _____

Non-breakable volumetric flasks with lids: 50 ml and 100 ml _____

Plastic storage bags for samples _____

Sample labels _____

Chain-of-custody forms _____

Marker Pens _____

2.Personal Equipment

Communication radio _____

PPE, as discussed in the Health and Safety Plan _____

Wrist or pocket watch _____

Rain gear _____

Duct tape _____

Pocket knife _____

First aid kit _____

Water cooler, filled with drinking water, and paper cups _____

3. Stream-Gaging Equipment

Clipboard with string to attach to hydrographer (if desired) _____

Velocity chart _____

Type AA current meters with spare parts (for high flow conditions only) _____

1 pygmy meter, with very small screwdriver _____

1 wading rod (complete) _____

1 head set (complete for wading measurements) and/or velocity meter _____

1 pair waders _____

1 stop watch _____

2 life jackets (for pond sampling in a boat) _____

Calibrated volumetric containers _____

Steel tapes and/or taglines, as required _____

Axe _____

Shovel _____

Meter Oil _____

4. Decontamination Equipment

Nonphosphate detergent _____

Distilled water, and, if desired, potable water _____

Buckets with lids, or other containers for environmental water _____

Brushes _____

Plastic Sheeting _____

5. Hand Tools and Supplies

Tool box _____

1 claw hammer _____

2 to 4 screwdrivers (small to large) _____

1 ordinary pliers _____

1 roll electrician's tape _____

6. Forms and Supplies

1 briefcase equipped with the following:

Applicable SOPs, HSP, FSP, and other required documentation _____

All necessary forms _____

Logbooks _____

Field folders for site to be evaluated _____

7. Automotive Equipment

Jack _____

Chains _____

Spare tire _____

Automobile accident forms _____

Credit cards _____

Tow rope or chain _____

Jumper cables _____